INTRODUCTION

MICROSKETCH II is written in Radio Shack TRS-80 BASIC (16K level II or 32K disk). When loaded under Disk BASIC, it takes full advantage of random access files for rapid screen or command string storage and retrieval. In addition to the Main System, MICROSKETCH contains five subsystems: Automatic Pattern Designer, Typewriter, Big Print, Graphic String Creation and Command String Creation.

The Main System has the capability of creating an infinite variety of graphics. Horizontal, vertical and diagonal lines may be drawn by holding down the arrow keys or the "1", "Z", "/" and "-" keys. The cursor may be moved to any position on the screen without disturbing the graphics already drawn. Either white lines on a black background or black lines on a white background may be drawn. This feature may also be used to "erase" lines previously drawn. The user has a choice of drawing either normal width or double width lines. The entire screen may be reversed at any time. (White areas become black and vice versa.) The top half of the screen may be folded down (i.e. The bottom half is replaced by a mirror image of the top) and the left half may be folded to the right. The entire screen may be cleared, but in addition, any single quadrant may be cleared independently. Two screens may be added together (merged). The entire screen may be "rotated" up, down, left or right. The current screen may be saved or loaded from tape, disk or main memory. Holding down the key will cause most single character commands to repeat. In the "Continuous" Mode, these same commands will repeat without holding down the key. In the "Kaleidoscope" Mode, whatever is drawn will automatically be reflected in the other four quadrants. By using various combinations of the above, any number of screens may be combined in an unlimited number of ways.

The Automatic Pattern Designer subsystem is capable of producing an almost unlimited variety of incredibly intricate patterns taking up the whole screen or any portion thereof. The cursor(s) will draw white lines if the screen is black or black lines if the screen is white. The screen may be made white by pressing <CLEAR> and then "R" under the Main System.

In the Typewriter Subsystem, the computer works like a high priced electric typewriter. Holding down any key will cause it to repeat. By entering the Continuous Mode ("C") before entering the Typewriter Subsystem, any key pressed will repeat without being held down, including the cursor positioning and other control keys.

The "Big Print" Subsystem features twenty-six different character sizes, all about four times normal height, but from three to 80 times normal width. The characters are produced simply by pressing the corresponding keys on the keyboard. The oversized characters must be drawn on a black background, but may be reversed by returning to the Main System and typing "R".

The Graphic String Creation Subsystem is a very powerful feature for program developement. One of the fastest ways to produce graphics is to "PRINT" them. Up until now, programmers have been producing graphic strings by laboriously drawing the graphics on a grid, calculating which graphic characters are needed, and then

"POKING" them into the string assignment statement. The graphic string subsystem eliminates all of the drudgery by producing graphic strings automatically. The user simply moves a special cursor over the portion of the screen to be converted. For disk users, a mergeable ASCII file may be produced. For non-disk users, the string assignment statements may be produced within the MICROSKETCH II program itself. Line numbers 21 through 139 have been reserved for this purpose, but any unused line numbers may be used as long as they don't interfere with the normal operation of the program. They could be located between subprograms, at the end of the program or a "GOTO" could be used to jump around them. After the strings have been produced, the rest of the program may be deleted and the string statements saved on tape. They may then be merged with another program, or a new program may be built around them. An auxiliary program called "Screen Save Utility" may be merged with any existing program in order to save that program's graphics on tape or disk. The graphics may then be modified and converted into strings by MICROSKETCH II for inclusion in the same or other programs. Both Level II and disk versions of the Screen Save Utility are available.

Under the Command String Creation Subsystem, the "G" command may be programmed. This programmable command may consist of between one and 255 single character commands. When the program is first RUN, the "G" command is programmed by default to rotate the screen to the right, then rotate it upwards, reverse the screen four times and then stop. The "G" command may be made to repeat automatically by typing "CG" under the Main System. Commands are also provided to save or load "G" commands on tape or disk.

Control may be passed from the Main System to any of the subsystems and back again without disturbing the current screen or the screen in main memory. This enables the user to create a wide variety of composite screens.

Any screen created using MICROSKETCH II may be transformed into a BASIC program by "MICROSCREEN" (16K - 32K disk). The generated program has the same capability of instant screen loading as MICROSKETCH, but with no neccessity to load the screens separately. The generated program may be executed as a stand alone program or as a subprogram. MICROSCREEN also has the ability to create animated motion by continuously loading up to 16 screens per second.

MICROSKETCH II is available from INTERNATIONAL DATA SERVICES, 340 West 55th St., New York, N.Y. 10019, (212)765-8610. For more information on MICROSCREEN or the Screen Save Utility programs, please call or write.

LOADING AND DEMO INSTRUCTIONS

To load the program, rewind the tape to the beginning, type "CLOAD" and press play. (Disk users must first type 'CMD"T"'.) If any difficulty is encountered, try loading the backup copy on side B. When the program is through loading, disk users may save the program on disk by typing 'SAVE"SKETCH2'. Type "RUN" and a program identification message will appear. To continue, press any key. The screen will clear and a cursor will begin to blink, indicating that the program is now ready to receive commands. Four demo screens immediately follow the

MICROSKETCH II program. Load the first screen by typing "LT" (Load Tape) and answer both of the prompts by typing <ENTER>. Press play and the screen will load. For a spectacular moving display, type "X" (32 characters/line) followed by "C." (Continuously rotate the entire screen to the right). To stop, press the space bar. Load the other three screens by repeating the above procedure. Screen #2 (the butterfly) has wings which were drawn using the Automatic Pattern Designer Subsystem.

You may exit the program by typing "Q" under the Main System or <BREAK> at any time. Screens which were previously saved in memory will not be lost even if "RUN" is typed.

NOTE: Because of numerous machine language subprograms embeded within the MICROSKETCH II code, the program listing may look like a "bad load". The best way to tell is to RUN the program or to list the last line (type "LIST9010").

MAIN SYSTEM COMMANDS

Sketch Control Commands:

↑, ↓, ← and → - Draw up, down, left and right respectively.
1 - Draw upper left.
- (Minus Sign) - Draw upper right.
Z - Draw lower left.
/ - Draw lower right.
D - Draw (white lines).
E - Erase (black lines).
M (Merge) - Add the screen in memory to the current screen and replace the current screen with the result. Alphanumeric and special characters on the current screen will be deleted, but these characters on the screen in memory will be retained.
, - Rotate screen left.
. - Rotate screen right.
A - Rotate screen up.
V - Rotate screen down.
X - Expand (Switch to 32 characters/line). (To switch back to 64 characters) /line, type ~~"SM", "M" or "Q", "RUN" <ENTER>, <ENTER>~~ "U".
<CLEAR> - Clear screen.
C1, C2, C3 and C4 - Clear upper left, upper right, lower left or lower right hand quadrants respectively.
R - Reverse video (Press following <CLEAR> to "white out" the screen). Only the graphics characters and spaces are affected by this command.
G (Go) - Execute command string (user programmable command). Use the Command String Creation Subsystem to program the "G" command.
FD (Fold Down) - Replace the bottom half of the screen with a mirror image of

the top half.

FR (Fold Right) - Replace the right half of the screen with a mirror image of the left half.

C (Continuous) - Switch to continuous mode. Used preceeding any combination of single character commands will cause the commands to repeat. The continuous mode may be terminated by pressing the space bar. Since "C1" is reserved for clearing the upper left hand quadrant, use "CD1" or "CE1" to continuously draw or erase to the upper left.

K (Kaleidoscope) - Switch to Kaleidoscope Mode. Draw or erase all four quadrants simultaneously.

I - Terminate Kaleidoscope Mode.

Cursor Control Commands:

<SHIFT>↑, ↓, ← or → - Move cursor up, down, left or right respectively.

O - Cursor on/off.

W - Wide cursor.

N - Narrow cursor.

System Switching Commands:

P - Enter Automatic Pattern Designer Subsystem.

T - Enter Typewriter Subsystem.

B - Enter the Big Print Subsystem.

↑ - Return to Main System from the Pattern Designer, Typewriter or Big Print Subsystems.

CC (Create Command) - Enter the Command String Creation Subsystem.

<ENTER> - Return from the Command String Creation Subsystem.

SS (Save String) - Enter the Graphic String Creation Subsystem.

S, <ENTER>, <ENTER>, <ENTER> - Return from the Graphic String Creation Subsystem.

Q (Quit) - Exit program, saving the current screen. This screen will be loaded automatically the next time the program is RUN, provided that MICROSKETCH II has not been re-loaded. This will not disturb a second screen saved in main memory.

Input/output Control Commands:

SD - Save screen on disk.

LD - Load screen from disk.

ST - Save screen on tape.

LT - Load screen from tape.

SM - Save screen in memory.

LM - Load screen from memory.

SC - Save "G" command string on tape or disk.

LC - Load "G" command string from tape or disk.

AUTOMATIC PATTERN DESIGNER SUBSYSTEM COMMANDS

I - Re-initialize Parameters. See "Program Messages and Prompts" Section, Page 7, for explanation of parameters. After all parameters have been entered, press any key to continue.
<SPACE BAR> - Start/stop cursor motion.
<CLEAR> - Clear screen.
H - Home cursor(s)
B (Backup) - Reverse cursor direction.
W - Switch to wide cursor(s).
N - Switch to narrow cursor(s).
↑ - Return to Main System.

The user may return to the Main System to save the screen, etc., and then return to the Pattern Designer Subsystem. The pattern will continue to be drawn as if no interruption had occurred.

TYPEWRITER SUBSYSTEM COMMANDS

<SHIFT>↑, ↓, ← and → - Move the cursor up, down, left or right respectively.
<CLEAR> - home cursor.
← - Delete the character immediately preceeding the cursor.
→ - Tab over to next position which is exactly divisible by 8.
↓ - Return to Main System.

All other keys cause the corresponding alphanumeric or special characters to be displayed on the screen at the cursor position.

BIG PRINT SUBSYSTEM COMMANDS

<SHIFT>↑, ↓, ← and → - Move cursor up, down, left or right respectively.
<CLEAR> - Home cursor.
↓ - Return to Main System.
← and → - Not used.

All other keys cause the corresponding alphanumeric or special character to be displayed at the cursor position, four times normal height and three to 80 times normal width.

GRAPHIC STRING CREATION SUBSYSTEM COMMANDS

↑ - Move cursor up. Add upward linefeed character to the string in write mode.
↓ - Move cursor down. Add downward linefeed character to the string in write mode.
← - Move cursor left. Add backspace cursor character to the string in write

mode.
→ - Move cursor right. Add advance cursor character to the string in write mode.
W (Enter write mode) - Begin creation of string at current cursor position.
<SPACE BAR> (Write mode only) - Move cursor right. Add character under cursor to the string and delete the character from the screen.
S (STOP) (Write mode only) - Terminate the writing of the current string.

Holding down any key will cause it to repeat. Return to the Main System by pressing <ENTER> in response to the prompts following the "S" command entry. If line numbers 30, 40 or 50 were used to write the string internally, type "Q" or <BREAK> to exit MICROSKETCH. Then type "RUN30". The strings may now be verified by printing them. i.e. type <CLEAR> followed by "?A$" where A$ might be any valid string name.

COMMAND STRING CREATION SUBSYSTEM COMMANDS

<SPACE BAR> (Null command) - Produces a short pause.
? - Delete string and start over.
<ENTER> - End command string and return to Main System. The command string may now be executed by typing "G" or "CG".

The following commands may be used in the string: ↑, ↓, ←, →, <SHIFT>↑, <SHIFT>↓, <SHIFT><, <SHIFT>→, ",", ".", A, V, R, M, <CLEAR>, N, W, 1, -, Z, /, X, and H. (The B, G, P and T commands may not be used.)

A string of up to 255 single letter commands may be entered. (See Main System Commands Section for explanation of commands.) If the first character of a two character command (i.e. C, F, L or S) is used in the command string, the execution of the command string will "hang", waiting for the second character to be entered from the keyboard.

NOTE TO DISK USERS: As an experiment, try listing the graphic screen files produced by MICROSKETCH II using the DOS "LIST" command.

PROGRAM MESSAGES AND PROMPTS (Listed Alphabetically):

"BAD FILE NAME" (Disk BASIC only) - An invalid file name was entered in responce to the "DISK FILE NAME" prompt.

"BOTTOM VERTICAL LIMIT (1 to 47)?" - Automatic Pattern Designer Prompt. Cursor #1 must stay above this limit. Default = 47. The "1" is equal to 1 plus the top vertical limit for wide cursor and is exactly equal to the top vertical limit for narrow cursor.

"BOT. VERTICAL LIMIT FOR CURSORS 3 AND 4 (46 to 47)?" - Automatic Pattern Designer prompt. This prompt is displayed only if there are 4 cursors and a value other than the default is entered for the top or bottom vertical limits for cursor #1. Although cursors 3 and 4 always produce mirror images of cursors 1 and 2, this parameter determines the position of the "mirror". The default value is such that the "mirror" will be placed half way down the screen. The "46" equals the bottom vertical limit minus the top vertical limit for cursor #1.

"CHARACTER SIZE (1 TO 26)?" - Big Print Subsystem prompt. Number entered determines character width.

"DISK FILE NAME?" (Disk BASIC only) - Enter a file name under which screens are to be loaded or saved. A drive number preceeded by a colon (:) may be appended. Default = "SKETCH2/SCR" for screen files, "SKETCH2/STR" for graphic string files and "SKETCH2/CS" for command string files.

"DISK FULL" (Disk BASIC only) - No more room on the disk. Use another disk, a different file name or a smaller disk record number.

"DISK RECORD NUMBER" (Disk BASIC only) - Enter a record number which has not been previously used. If the number entered was used previously, the old screen or command string is deleted. The maximum record number depends upon the available disk space. Each record takes up four sectors for a screen and one sector for a command string.

"ENTER A STRING OF ONE CHARACTER COMMANDS (MAX. LENGTH = 255) (Enter a "?" to start over):" - Command String Creation Subsystem prompt. Program the "G" command by entering a string of one character commands.

"FILE NOT FOUND" (Disk BASIC only) - An attempt was made to load from a non-existant file.

"HOW MANY SCREENS?" - Enter the number of screens to be loaded. Default = 1. Only the last screen loaded is retained.

"INCREMENT?" (Disk BASIC only) - Graphic String Creation Subsystem prompt. Refers to the number to be added to the previous line number to get the new line number in the mergeable graphic string disk file.

"INVALID DRIVE NUMBER" (Disk BASIC only) - A non-existant disk drive number was

appended to the file name.

"LEFT HORIZONTAL LIMIT (0 to 125)?" - Automatic Pattern Designer prompt. Cursor #1 must stay to the right of this limit. Default = 0. If the cursor is "narrow", the "125" is 126.

"LINE LENGTH = " - Graphic String Creation Subsystem message. Refers to the line specified in the "WHICH LINE NUMBER" prompt.

"LINE NOT FOUND" - Graphic String Creation Subsystem message. A non-existant line number was entered in response to the "WHICH LINE NUMBER" prompt.

"MICROSKETCH II / COPYRIGHT 1979, INTERNATIONAL DATA SERVICES" - Identification message. Displayed only when the program is first RUN. Press any key to continue. An attempt to delete this message may result in program malfunction.

"NAME OF STRING # 1 OF LINE # 30?" - Graphic String Creation Subsystem prompt. Enter a valid string name such as "A$" or "Q9$(12)". The "1" refers to the number of strings being written to a particular disk file or the number of internal strings being written to a particular line during the current entry into the Graphic String Subsystem. The "30" refers to the number of the line being written to.

"NARROW OR WIDE CURSOR?" - Automatic Pattern Designer initialization prompt. Default is wide cursor.

"NOT DISK BASIC" (Level II only) - A disk command was entered under Level II BASIC.

"NUMBER OF CURSORS (1 or 4)?" - Automatic Pattern Designer prompt. Enter number of simultaneous cursors. Default = 4.

"POSITION TAPE: READY?" - The tape recorder motor is turned on to allow the tape to be positioned without unplugging the remote plug. Press <ENTER> after the tape has been positioned.

"PRESS PLAY" - No response neccessary except to press the play button on the recorder.

"PRESS RECORD: READY?" - Press <ENTER> after tape has been positioned and the record and play buttons have been pressed.

"RIGHT HORIZONTAL LIMIT (2 to 127)?" - Automatic pattern designer prompt. Cursor #1 must stay to the left of this limit. Default = 127. The "2" is 2 plus the left horizontal limit for wide cursor and 1 plus the left horizontal limit for narrow cursor.

"RT. HORIZONTAL LIMIT FOR CURSORS 2 AND 4 (126 to 127)?" - Automatic Pattern Designer prompt. This prompt is displayed only if there are 4 cursors and a value other than the default is entered for the left or right hori-

zontal limits for cursor #1. Although cursors 2 and 4 always produce mirror images of cursors 1 and 3, this parameter determines the position of the "mirror". The default value is such that the "mirror" will be placed in the center of the screen. The "126" equals the right horizontal limit minus the left horizontal limit for cursor #1.

"STARTING DISK RECORD NUMBER?" (Disk BASIC only) - Enter a record number which corresponds to a previously saved screen. If more than one screen is to be loaded, enter the first record number of the series.

"STARTING LINE NUMBER?" (Disk BASIC only) - Graphic String Creation Subsystem prompt. Line number of the first line of a mergeable graphic string disk file.

"TAPE OR DISK?" (Disk BASIC only) - Save or load command string prompt. Determines whether command string is saved or loaded to tape or disk.

"TOP VERTICAL LIMIT (0 to 46)?" - Automatic Pattern Designer prompt. Cursor #1 must stay below this limit. Default = 0. The "46" is 47 for narrow cursor.

"WHICH LINE NUMBER" - Graphic String Subsystem prompt. Enter the number of an unused line in the MICROSKETCH II program into which the graphic string(s) may be written. Line numbers 30, 40 and 50 are reserved for this purpose.

"WRITE STRINGS INTERNALLY OR TO DISK?" (Disk BASIC only) - Graphic string creation subsystem prompt. "INTERNALLY" refers to within the MICROSKETCH II program itself. Default = "INTERNALLY".